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ABSTRACT

This study compares selected in-school characteristics found to be significantly related to in-school success, to on-the-job success as measured by the employer's evaluation. Subjects were male high school graduates of both academic and vocational curricula who were actively employed approximately one year after graduation. The research questions in this study are concerned with a comparison of job satisfactoriness (success as rated by the employer) for vocational and academic high school graduates, and the relationship of ninth grade student characteristics to job satisfactoriness approximately one year after graduation. Results indicate, in part, that: (1) neither the academic nor the vocational curriculum can be said to better prepare male graduates for employment one year after high school based on the employer's evaluation; (2) the male graduate's verbal and numerical aptitude, and the salary received are most predictive of on-the-job success; (3) all of the factors related to on-the-job success were also related to in-school success; (4) the ability of ninth grade characteristics to predict on-the-job success as defined in this study is of significant magnitude. (Author/HMV)

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THE PENNSYLVANIA STATE UNIVERSITY
DEPARTMENT OF VOCATIONAL EDUCATION

THE RELATIONSHIP OF HIGH SCHOOL CURRICULUM AND OTHER IN-SCHOOL CHARACTERISTICS TO EMPLOYMENT SUCCESS ONE YEAR AFTER GRADUATION

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Bureau of Vocational, Technical and Continuing Education
Research Coordinating Unit
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The Pennsylvania State University

University Park, Pennsylvania

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PREFACE

This research monograph is the sixteenth in the Vocational Development Study (VDS) series which began several years after the initiation of the VDS project in the Fall of 1968. This project is being supported by Pennsylvania's Research Coordinating Unit (RCU) in Vocational Education with the cooperation of the Altoona, Hazleton and Williamsport school systems. The goals of the VDS project are to conduct studies in the areas of vocational education and guidance which have a longitudinal emphasis.

The study reported in this monograph is very much in keeping with the longitudinal nature of the VDS project in that a sample of Altoona male high school graduates from two different types of high school curricula (Academic vs. Vocational) is examined in terms of on-the-job success as viewed by their employers. Also, the study utilizes ninth grade student characteristics to predict on-the-job success one year after graduation. The findings of this study should be useful to vocational and non-vocational educators alike whether they be teachers, counselors or administrators. A overview of the study is provided in the blue page VDS capsule for those readers who may want a quick overview of the major findings and implications as seen by the author.

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VDS CAPSULE

This section is an abstract of the findings and implications of the study reported in this monograph. It is designed to serve as an informative summary of the content of this publication which, hopefully, will encourage the investigation of the total work.

This research compares selected in-school characteristics found to be significantly related to in-school success in previous VDS studies to on-the-job success as measured by the employer's evaluation. The sample consisted of male Academic and Vocational high school graduates who were engaged in employment approximately one year after graduation.

The research questions in this study are concerned with a comparison of job satisfactoriness (success as rated by the employer) for Vocational and Academic high school graduates, and the relationship of ninth grade student characteristics to job satisfactoriness approximately one year after graduation.

Findings

1. Neither the Academic nor the Vocational curriculum can be said to better prepare male graduates for employment one year after high school graduation based on the employer's evaluation of satisfactoriness.
2. The male graduate's verbal and numerical aptitude, and the occupational value of salary are most predictive of on-the-job success.
3. Although the exact nature of the relationship is not known, the male graduate's occupational value of interest and satisfaction appears to have an important relationship to the employer's evaluation of on-the-job success.

4. The vocational maturity level of male graduates as measured in ninth grade is negatively related to on-the-job success one year after graduation.

5. All of the factors found to be related to on-the-job success have also been found to be related to in-school success, although in this case, vocational maturity is negatively related to on-the-job success whereas it was positively related to in-school success.

6. The ability of ninth grade characteristics to predict on-the-job success evaluated by employers one year after graduation, (i.e., four years after the characteristics were measured), is of a relatively large magnitude considering the time duration and developmental instability of adolescent characteristics.

Implications

1. Curriculum alternatives should not be restricted to Academic versus Vocational choices. Vocational and Academic curricula must share goals and be considered mutually responsible for the success of graduates in future employment.

2. A career education approach which does not restrict individuals to narrow curriculum tracks could be the best method of providing the education necessary for success in the world of work.

3. Verbal and numerical skills appear to be as important to early job success as they are for academic success. For this reason, students expecting to enter employment immediately after graduation from High School should be provided with the same quality of instruction in these areas as are perspective college students.

4. In addition to cognitive factors (verbal and numerical ability), factors from the affective domain (occupational values and vocational maturity) appear to be very important to early job success. Clarification of these factors beginning as early as the ninth grade should aid initial job selection and subsequent job success.

5. Guidance and counseling personnel should take the variables found to be predictive of on-the-job success into account in both curriculum and job placement counseling. This information is apparently useful as early as the ninth grade. In addition, the ability to predict success in the world of work could be used in designing new programs to meet the needs of individuals and of society.

6. A program of testing and record keeping which could help to identify the individual predictive factors related to on-the-job success should be instituted in the schools for graduates of all programs.

I

ORIGIN OF THE STUDY

Introduction

Vocational education is concerned with man's attempt to learn to work and to pass this knowledge on to succeeding generations. Man has been involved in work of one type or another throughout his history. Work has been the means to satisfy both needs and wants. Just as the nature of man's work has changed with time, so have his attitudes changed toward work and education for work. As man became involved in different ways of working, he learned that some men were better able than others to perform certain tasks. This discovery marked the beginning of specialization and division of labor. On the basis of the idea of specialized abilities and interests, youth could be encouraged to learn specific vocational skills. An early method of instruction developed to teach such skills was the apprenticeship system which was the first form of organized vocational training (Roberts, 1957, p. 23).

The early Egyptian and Babylonian civilizations employed the method of apprenticeship training to transmit practical knowledge. During Greek and Roman times, work was considered degrading and was left to the lower strata of society. Vocational adjustment meant being a member of the leisure or ruling class, thus escaping the stigma of work (Crites, 1969, p. 326). During this time, apprenticeship was the form of education for practical skills. With the fall of the Roman Empire in the fifth century, the emphasis on education was removed, and Western civilization gradually entered the Dark Ages of the medieval

period. Throughout this period the meaning of work remained essentially unchanged. What little systematic learning did occur was within the confines of monasteries and was essentially religious in nature. Theological emphasis was on work as a means to an end. The teachings of St. Benedict, St. Thomas, and St. Augustine typified the belief in work as expiation from sin leading to eventual salvation (Crites, 1969, p. 327).

Attitudes toward work and education remained essentially unchanged until the sixteenth century when Humanistic studies of a general-cultural nature gave rise to the Reformation. The Protestant Movement exemplified the Realistic trend of the seventeenth century, and the emphasis shifted to education for all the people. Martin Luther radically changed the concept of work to include the intrinsic value of work itself. Work became a way of serving God and of making one's contribution in life, a concept often referred to as the Protestant Ethic.

Education in the New World was the embodiment of educational trends in Western Europe. Apprenticeship continued, religious schools proliferated, Latin grammar schools existed for the wealthy, and practical schooling took root. The New England colonists, motivated by the Protestant work ethic and ideas of equality stemming from the Reformation, fostered the idea of public education. Public education to this day reflects the dichotomization of education in the Humanistic and Realistic traditions. The Academic curriculum in our public school system is the outgrowth of the Realistic philosophy of the seventeenth century. Thus, our present public educational system has a centuries-old tradition. The question arises as to whether a system of education

adapted to the needs of the sixteenth and seventeenth centuries is appropriate to educational needs of the twentieth century.

If our educational system is considered old, our basis for selection of students is at least as old. Apprenticeship selection in early Egypt and Babylonia was based on abilities and aptitudes (Roberts, 1957, p. 23). Constraints were placed on educational opportunity according to class in Greek and Roman times. Acceptance into apprenticeship in the colonies, except in the case of compulsory apprenticeship, was, in many cases, on the basis of interests. These characteristics are the very same ones which determine educational and vocational selection today. Current research has emphasized the role of abilities and interests in the process of educational and occupational choice modified by environmental constraints (Ginzberg, et al., 1951; Super, 1953). Thus, both cognitive and affective factors in vocational selection have been recognized throughout recorded history although they were not always clearly differentiated.

Today, social class and family no longer predetermine occupation. Each individual must select both his educational curriculum and his occupation. By offering this choice to youth, public educators have accepted the responsibility to assist each individual in making that choice which will be most satisfying to him and most productive for society. On what basis should these choices be made, and what criteria should be used to judge the adequacy of choice? Presently, many students must make their curriculum choice in ninth grade although students at this age may not be ready to make specific vocational choices (Super and Overstreet, 1960, p. 152). Likewise, all students, whether or not they are continuing their education, must make career

decisions at the end of their senior year for which they are often ill-equipped. Educators must be concerned with determining those factors upon which curriculum and career decisions can be based and which will lead to success and satisfaction.

In the 1930's, two major research projects were undertaken in the field of work adjustment which still remain influential today. During the 1920's and 1930's, E. L. Thorndike and associates undertook a study to predict vocational success. This study was the first in the area of vocational success and remains one of the most frequently cited research efforts of its kind. Thorndike used aptitude tests and the cumulative records of elementary and secondary school students to predict success. He tested students fourteen years old in the eighth grade and then did follow-up studies on the same students at ages 18-20 and again at ages 20-22. The subjects were from New York City during the years 1921-1922 and were selected to represent a wide range of intellectual ability. Thorndike found little correlation between school records, test scores, and later vocational success. He concluded that the largely "academic" predictors became efficacious only when workers had advanced to jobs in which success depended on earlier educational experiences (Crites, 1969, p. 460). He also concluded that skills and experiences necessary for success may be obtained on the job.

The second major study to focus attention on the problem of work adjustment in the 1930's was reported by Robert Hoppock (1935) in Job Satisfaction. Hoppock conducted a pioneer study in job satisfaction in New Hope, Pennsylvania, during the Depression years. His conclusions were centered mainly on worker satisfaction, but they helped to direct attention to the more general problem of work adjustment.

The concept of vocational adjustment has undergone many changes and has had various interpretations. Many factors combine to make up the general classification of adjustment. Lurie (1942) described vocational satisfaction and success as distinct, but not independent, components of vocational adjustment. Lurie and Weiss (1942) expanded this complex of factors to include satisfaction, success, and other variables. In 1955, Brayfield and Crockett classified the literature on employee attitudes and performance into three main categories: performance on the job, withdrawal from the job, and attitudes of individuals and groups. By 1957, the concensus of opinion with regard to satisfaction and performance was that "these two variables were not consistently and systematically associated with each other. The relationship, if it exists, is complex and contingent upon many other factors" (Crites, 1969, p. 520).

During the 1960's, research continued to support the idea that job satisfaction and performance are not related. Kahn (1960), in conjunction with the Survey Research Center at the University of Michigan, found no significant relationship between productivity and job satisfaction. Vroom (1964) also found no simple relationship between job satisfaction and performance. For twenty studies conducted in the previous 75 years, Vroom found the median correlation between satisfaction and success to be .14, ranging from -.31 to +.86 (Crites, 1969, p. 519). Vroom concluded:

> The absence of a marked or consistent correlation between job satisfaction and performance casts some doubt on the generality or intensity of either effects of satisfaction on performance or performance on satisfaction. It also suggests that the conditions which determine a person's level of job satisfaction and his level of ability are not equal (Vroom, 1964, p. 187).

Drawing on the work of Heron (1954), the staff of the Work Adjustment Project at the University of Minnesota has divided the larger topic of work adjustment into two major components: Satisfaction and Satisfactoriness. Satisfaction represents the intrinsic employee attitudes toward work adjustment, and Satisfactoriness represents the employer's extrinsic evaluation of the employee's performance. Satisfaction and Satisfactoriness are the two sides of work adjustment as viewed by the employee and the employer, and both combine to make up job success. Work adjustment is the broader "process occurring throughout a person's life" and "by which the individual interacts and comes to terms with his work environment" (Betz, et al., 1966, pp. 4-5).

Research which conforms to this pattern of Satisfaction - Satisfactoriness is greatly needed in the area of work adjustment for both prediction purposes and as a means of testing current vocational development theories. Educators need to be able to predict work adjustment potential from personal factors so that curriculum can be modified and optimum use of individual potential can be achieved. However, research which does not take these two components into consideration may have a base too general to be applicable in reality. Therefore, research concerning work adjustment should follow two lines: prediction of Satisfaction and prediction of Satisfactoriness. Only Satisfactoriness will be considered in this study as one aspect of the larger framework of work adjustment and vocational development.

Statement of the Problem

Two of the major curricular trends in high school education today are the Vocational and Academic curricula. The Academic curriculum is

designed to fulfill the needs of students planning to continue their education, while the Vocational curriculum has been geared to the development of entry level skills in some vocational field to promote employability upon graduation. In reality, however, these two curricula often share responsibility for student employability. Many Academic students seek employment upon graduation while many Vocational students continue their education. The present study will be concerned with those students from both curricula who terminate their education with graduation from high school and seek employment.

Beginning in 1968, the Department of Vocational Education at the Pennsylvania State University undertook the longitudinal Vocational Development Study (VDS) project to identify the effects of the senior high school experience upon youth. This project was designed to encompass the continuous study of three separate samples of ninth grade students for a ten year period ending seven years after each sample leaves high school (Impellitteri and Kapes, 1971a). As part of the VDS study, Kapes (1971) used ability measures, occupational values, vocational maturity, family background measures, and occupational aspirations to predict high school curriculum selection and success for tenth grade boys in the first of the three samples. A similar study utilizing a sample of girls from the same school was conducted by McAlister (1973). The present study will use some of these same variables in order to examine their relationship to on-the-job success for a subset of this same sample one year after high school graduation.

In the past there have been many studies concerning the post-high school employability and related job success of recent high school graduates (Carlson, Davis, and Weis, 1968; Weis, 1969; and Todd, 1972).

The ongoing Work Adjustment Project at the University of Minnesota is one such project with particular relevance to the present study. Through the efforts of the research staff of the Work Adjustment Project, many instruments have been developed to measure various aspects of work adjustment, satisfaction, and performance. This study will make use of one of the instruments developed at the University of Minnesota to measure job Satisfactoriness.

One of the major arguments for the expansion of vocational education has been the continued insistence that Vocational Education prepares the student for the world of work. This criterion is perhaps not the most important argument for the continuation of the Vocational program; however, it has been widely proclaimed. The present study will compare the graduates of a Vocational-Technical curriculum to the graduates of an Academic curriculum to see if Vocational students do, in fact, show greater preparation for the world of work as evidenced by their success (Satisfactoriness). This study will use many of the same ninth grade predictor variables employed in the previous VDS studies by Kapes (1971) and McAlister (1973) and will investigate their relationship to on-the-job success (Satisfactoriness).

The two questions to be considered in this study are:

1. Does the Vocational or Academic curriculum more adequately prepare students for work adjustment approximately one year after high school graduation as measured by job Satisfactoriness?
2. What is the relationship between each of the following ninth grade student characteristics and job Satisfactoriness approximately one year after graduation from high school?

a. abilities

b. occupational values

c. vocational maturity

d. family background

e. occupational aspirations

II

REVIEW OF RELATED LITERATURE

Introduction

In order to identify other research relevant to the present study, a review of the literature was conducted. The literature review was grouped into four categories:

1. Publications concerned with the Work Adjustment Theory.
2. Studies or other publications related to Satisfactoriness or on-the-job success.
3. Previous Vocational Development Study (VDS) research specifically related to the present study.
4. Studies which relate to the student characteristics of interest in this study.

The fourth division will not be covered in the present review because it has been previously covered by Kapes (1971) upon whose research the present study is dependent and whose study will be reviewed in depth in division three.

The material found in these categories is not all inclusive but is an attempt to extract and synthesize that research which is most directly related to the present effort.

Publications Concerned With Work Adjustment Theory

The major theoretical framework in which this study was conducted has been drawn mainly from the Work Adjustment Theory developed at the University of Minnesota by Dawis, England, Lofquist, Weiss, and others.

The Work Adjustment Theory itself was based on the work of Viteles in Vocational Psychology and Peterson in conjunction with the Minnesota Employment Stabilization Research Institute. Other sources of influence were the British psychologists Alec Rodgers and Alistair Heron. The Work Adjustment Theory arose out of a concern for placement which would help each individual find his place in the world of work (Dawis, England, and Lofquist, 1964; Dawis, Lofquist, and Weiss, 1968; and Weis, 1969). It is an interactionist theory stressing the interplay of the individual and the work environment. The theory itself is both stable and dynamic. It is stable in that it can be used to predict the probable work adjustment status of an individual at some specific point in time. It is also a dynamic "process occurring throughout a person's working years" (Betz, et al., 1966, p. 4). The Work Adjustment Theory is concerned with the description, prediction, and facilitation of work adjustment both generally and specifically.

The Theory of Work Adjustment is based on the concept of "correspondence between the individual and the environment" (Dawis, Lofquist, and Weiss, 1968, p. 3). This correspondence between the individual and his work environment is termed consonance or agreement. A basic assumption is that "each individual seeks to achieve and maintain correspondence with his environment" (Dawis, Lofquist, and Weiss, 1968, p. 3). The individual and the work environment are mutually responsive, and both have requirements for the other. The individual brings skills to the work situation, and the environment supplies rewards. The individual has certain abilities and needs while the job provides specific ability requirements and reinforcers. Work adjustment is the "process by which the individual interacts and comes to terms with his

work environment" (Betz, et al., 1966, p. 5). A further definition of work adjustment is:

> The continuous and dynamic process by which the individual seeks to achieve and maintain correspondence with his work environment . . . (Dawis, Lofquist, and Weiss, 1968, p. 5).

The process of individuation of the work personality takes place to a point of relative stability or crystallization. The Theory of Work Adjustment is premised on the existence of a relatively stable work personality at some point in time.

Basic to the work personality are abilities and needs. Abilities and needs undergo development through social and educational experiences. "Abilities are basic dimensions of response capability generally utilized by the individual," and "needs are preferences for responding in certain stimulus conditions which have been experienced to be reinforcing" (Dawis, Lofquist, and Weiss, 1968, p. 9). Each individual has unique response potentials which react with the environment. Needs and abilities are measured independently but are interdependent variables. It can be expected that some relationship exists between measured needs and measured abilities although the magnitude would be expected to be less than that within either. Weiss, Dawis, Lofquist, and England have found that ". . . the majority of the correlations between needs and abilities were lower than the intercorrelations among needs and abilities" (Weiss, et al., 1966, p. 35). Occupational Ability Patterns (OAP) are determined by measuring the "dimensions of response measurable through the application of psychological testing procedures, principally by ability and aptitude tests" (Weiss, et al., 1966, p. 11). Occupational Reinforcer Patterns (ORP) are determined by measuring "dimensions of reinforcement experience associated with classes of stimulus

conditions which operate differentially as effective reinforcers" (Weiss, et al., 1966, p. 11). Needs and abilities are the predictor variables specified by the Work Adjustment Theory.

The criteria variables specified by the Work Adjustment Theory are Satisfaction and Satisfactoriness. Satisfaction is a function of needs, and Satisfactoriness is a function of abilities.

> Satisfaction . . . included overall job satisfaction and satisfaction with various specific aspects of the individual's work environment, such as his supervisor, his co-workers, his working conditions, hours of work, pay, and type of work. It included the satisfaction of his needs and the fulfillment of his aspirations and expectations and the similarity of his interests to those of successful persons working in his chosen occupation (Betz, et al., 1966, p. 3).

Satisfaction is work adjustment from the viewpoint of the individual employee. The five major components of satisfaction are general satisfaction, satisfaction with working conditions, supervision, compensation, and co-workers. Satisfaction is an internal indicator of the extent to which the work environment fulfills an individual's requirements. It does, however, differ from vocational needs. Job Satisfaction can be predicted from the correspondence between measured vocational needs and either estimated or inferred job reinforcement systems.

Satisfactoriness is a function of the correspondence between the individual's abilities and ability requirements of the job. It is work adjustment viewed from the perspective of the employer.

> Satisfactoriness included such components as the worker's productivity and efficiency, the congruence of his abilities with job requirements, his ability to get along with his supervisor and his co-workers, and to follow company policies (Betz, et al., 1966, pp. 3-4).

Satisfaction and Satisfactoriness together constitute work adjustment. Satisfaction is the internal indicator viewed by the employee, and Satisfactoriness is the external indicator as viewed by the employer.

> Satisfactoriness is a function of the correspondence between the individual's abilities and the ability requirements of the job, while Satisfaction is a function of the correspondence between an individual's needs and the reinforcer system in the job (Weiss, et al., 1966, p. 4).

Satisfaction and Satisfactoriness can also be viewed as outcomes of work adjustment. Thus, measurement of work adjustment can be used to establish a methodology for the prediction of work adjustment from the assessment of work personalities in relation to work environments. A major tenet of the Work Adjustment Theory is that Satisfaction and Satisfactoriness are independent although interacting sets of variables. Studies conducted by the Work Adjustment Project comparing cross correlations between the Minnesota Satisfaction Questionnaire, the measuring device for job Satisfaction, and the Minnesota Satisfactoriness Scale, the measuring device for job Satisfactoriness, found less than 2% of the variance to be common between Satisfaction and Satisfactoriness (Weiss, et al., 1966, p. 62; and Weiss, et al., 1967, p. 25). This finding lends support to separate measurement of Satisfaction and Satisfactoriness variables. "The concurrent levels of an individual's Satisfactoriness and Satisfaction measure his work adjustment in a particular work environment at a given point in time" (Weiss, et al., 1967, p. 9).

In summary, the Theory of Work Adjustment is based on the psychological concepts of stimulus response and reinforcement. It provides a research paradigm in a developmental context evolving over time. Work personality is a developmental process well underway by preschool age which continues to some point of crystalization of a relatively stable work personality. The strength of an individual's abilities and needs depends on the extent to which they have been reinforced in the past.

If abilities and needs are frequently reinforced, they develop into relatively fixed ability and need sets constituting the stable work personality (Crites, 1969, p. 345). At a point in time, work adjustment can be defined as the concurrence of Satisfaction and Satisfactoriness.

Studies and Other Publications Related to Satisfactoriness or On-the-Job Success

In School Achievement and Post-School Success: A Review (Levine, et al., 1971), the authors attempted to explore the relationship between education, individual opportunity, and individual success. They were particularly concerned with the relationship between post-school opportunity and performance, and achievement in school. The criteria chosen to represent opportunity were: lifetime earnings; occupational attainment; political participation; social, economic, and geographic mobility; school choice; military service options; and social deviance (Levine, et al., 1971, p. 3).

Opportunity and success are most often considered in light of monetary earnings because of the availability of these data. However, education accounts for only a portion of an individual's earnings. Other factors such as community, inherited characteristics, etc., all play a part in the determination of earnings. Thus, analyses must attempt to separate the distinct effects of schooling from those of other influences. Evidence demonstrates that higher earnings accompany higher quality and quantity of schooling while lower earnings, conversely, accompany lower quality and quantity of schooling (Becker, 1964; Denison, 1962). Denison estimated that 60 percent of the difference among individuals' earning capacities was attributable to schooling. A

more recent study by Bowman and Anderson (1969) suggests that Denison's estimate understates the significance of schooling. Further studies by Griliches (1968) and Conlisk (1968) found that the introduction of IQ measures into the analysis did not reduce the impact of schooling. Hanock (1965), using the "one in one thousand sample" for the 1960 census, found a strong correspondence between schooling and earnings after adjusting for individual differences other than schooling.

The review conducted by Levine, Guthrie, Kleindorfer, and Stout (1971) also investigated the relationship between social and economic mobility over generations. The authors concluded that "an individual's increased educational attainment is likely to improve his children's opportunities" (Levine, et al., p. 9, 1971). Blau and Duncan (1967) demonstrated that the higher the occupational achievement of the father, the higher the occupational achievement of the son; and, likewise, the more educated the father, the more educated the child.

In conclusion, Levine, et al. found that, although studies differed in their specific findings on the relative magnitude of the schooling-earnings effect, almost all of the studies showed evidence of a significant effect (Levine, et al., p. 8, 1971). In the area of social and economic mobility over generations, Levin et al. concluded that "upward mobility over generations seems to be directly affected by education" (Levine, et al., 1971, p. 10).

Cox (1971) posed the question, "What relationships exist between various predictor measures obtained on students while in training and a particular global definition of success?" (Cox, 1971, p. 271). His sample was drawn from Hoyt's Specialty Oriented Student (SOS) Research Program consisting of 453 students between 18 and 21 years old who had

attended private trade, technical, and business schools during 1962-1963 and who responded to a mailed questionnaire. A vocationally successful individual was defined as one who was "working in a training-related job five years after training, felt quite certain that the work was appropriate for him, had had an increase in wages over the five-year period, and exhibited job stability by having been employed in his present job for more than four years" (Cox, 1971, p. 272). Predictor variables included Crites' Vocational Development Inventory (VDI) and instructor criterion ratings (Scholastic Decile Rankings). These data were collected for each individual in the following categories: 257 trade-technical school males, 65 business school males, and 131 business school females. None of the correlations were significant at the .05 level of confidence for the total sample, trade-technical school males, or business school males. However, for the business school females, both Vocational Development Inventory (+.19) and instructor ratings (+.30) were significant.

R. G. Anderson (1949) conducted a Rorschach examination of the personalities of machinists. Research such as that conducted by Anne Roe had suggested that personality was related to occupational success. However, studies by Dodge (1938; 1940; 1943; 1948) of teachers, sales people, and clerical workers found the differences between successful and unsuccessful workers on Bernreuter personality items to be small, seldom exceeding 20%. Anderson's findings, on the other hand, showed that some workers with low mechnaical aptitude received high ratings from their supervisors while others with high aptitude were given low ratings. Analysis of Rorschachs of deviant workers suggested that personality was the moderating variable accounting for the distinction

in supervisor evaluation (Crites, 1969, p. 457). Thus, an employee with low aptitude but favorable personality might be evaluated higher by his supervisor than an employee with high aptitude and unfavorable personal characteristics. Super and Crites (1962, pp. 569-570) have suggested that personality might be a compensating or handicapping factor in the attainment of success.

In a study by Ghiselli and others, maturity of self-perceptions, similar to Vocational Maturity, was found to be significantly related to vocational success (Ghiselli, 1964; Ghiselli and Barthol, 1956). In a separate study by the Industrial Relations Center at the University of Minnesota, the factors: sex; age; education; economic pressures; and nature and origin of disability were related to the success of handicapped workers (Schletzer, et al., 1959).

The work of E. L. Thorndike and his son, R. L. Thorndike, has provided predominately negative results in predicting employment success by means of aptitude tests and some non-intellective variables. None the less, the work of the Thorndikes is noteworthy for its stimulation of further research in the area of vocational success and work adjustment.

E. L. Thorndike's classic study of New York Secondary School students, cited earlier, attempted to use aptitudes to predict success. The aptitudes tested included: arithmetic, reading, abstract intelligence (a combination of the two preceeding aptitudes), clerical intelligence, clerical activities, and mechancial "adroitness." Zero-order and multiple correlations were the statistical techniques used to predict success. There were sizable correlations between the independent variables and in-school educational success, but the correlations between the independent variables and vocational success were low. The

highest correlation for vocational success was .26 between clerical intelligence and earnings for the 20-24 age group. No r's in the mechanical or other groups exceeded +.14 (Crites, 1969, p. 459).

Previous Vocational Development Study (VDS) Research Specifically Related to the Present Study

In conjunction with the Vocational Development Study (VDS) Project at Penn State, several studies have been conducted using the graduating class of 1972 of Altoona High School. Kapes (1971), O'Reilly (1972), and McAlsiter (1973) studied the relationships between characteristics of this student sample and in-school success. The present study will use the same sample to examine the relationship between some of the same in-school success variables and on-the-job success.

Kapes (1971) studied the relationship between characteristics of 9th grade boys and success in the 10th grade Academic and Vocational curricula. The independent variables in this study were: GATB aptitudes, Verbal (V), Numerical (N), Spatial (S), Form perception (P), Clerical perception (G), Motor coordination (K), Finger dexterity (F), Manual dexterity (M); four occupational values, Interest and Satisfaction, Salary, Prestige, and Security; Vocational Maturity; two family background measures, Father's Educational Level, and Father's Occupational Level; and Occupational Aspiration.

Zero-order correlations for these 16 variables showed that 12 of these variables possessed a significant relationship with the dependent variable, Vocational GPA, at either the .05 or the .01 level. Only the values, Salary and Security, and the family background measures, Father's Educational Level and Occupational Level, were not significantly

related to Vocational GPA. Using MRA, examination of the partial regression coefficients in the full model indicated that only the GATB variables V and N are significant unique contributers to the prediction of Vocational GPA. The unadjusted coefficient of determination (R^2) was equal to .31, and the adjusted coefficient of determination ($\bar{R}^2$) was equal to approximately .26. The overall F-ratio was equal to 6.4799 and was significant beyond the .01 level. The restricted model obtained by the step-down technique found GATB variables V and N and the occupational value, Prestige, to be useful in predicting Vocational GPA. The overall F-ratio calculated for the restricted model was 31.4568 which was significant beyond the .01 level. The $\bar{R}^2$ was equal to .27.

Zero-order correlation for the 16 independent variables showed that GATB variables, K, F, and M, and occupational values, Salary and Prestige, were not significantly related to Academic GPA. GATB N and V, Vocational Maturity, Father's Education, and Occupational Aspiration were found to be significant unique predictors of Academic GPA using full model MRA. The R^2 was equal to .53. The $\bar{R}^2$ was approximately equal to .50, and the significance of the total relationship as tested by the overall F-ratio was 13.6999, significant beyond the .01 level. These same five variables were found to be useful in predicting Academic GPA by using the step-down technique to obtain a restricted model. The overall F-ratio calculated for the restricted model was equal to 44.0887 and was significant beyond the .01 level. The $\bar{R}^2$ was equal to .51.

This same study was replicated by McAlister (1973) using a sample of girls. McAlister's findings, using full model MRA to predict Vocational GPA, were that only GATB-V, Interest and Satisfaction, and

Vocational Maturity were significant contributors. The R^2 was .48. The $\bar{R}^2$ was equal to .42, and the significance of the total relationship as tested by the overall F-ratio was equal to 7.6412 and was significant beyond the .01 level. Use of step-down technique to obtain a restricted model added GATB-N to the preceeding three independent variables as significant predictors of Vocational GPA. The overall F-ratio for the restricted model was 29.8572 and was significant beyond the .01 level. The $\bar{R}^2$ was equal to .44. McAlister's analysis discovered six independent variables, GATB-V, GATB-N, GATB-Q, Salary, Vocational Maturity, and Father's Education to be significant full model contributors to Academic GPA. The R^2 was equal to .58. The $\bar{R}^2$ was approximately equal to .55 while the significance of the total relationship as tested by the F-ratio was equal to 17.7885 and was significant beyond the .01 level. Step-down technique was employed to obtain a restricted model resulting in five remaining independent variables: GATB-V, GATB-N, Salary, Vocational Maturity, and Father's Education. The overall F-ratio was equal to 53.3367 and was significant beyond the .01 level. The $\bar{R}^2$ was equal to .54

A third study conducted by O'Reilly (1972) found GATB-V, GATB-N, GATB-S, GATB-Q, Interest and Satisfaction, and Vocational Maturity to be significantly correlated with 10th grade GPA. However, GATB-N was the only student characteristic variable unique enough to predict a significant portion of 10th grade GPA when taken in combination with all of the other 15 student characteristic variables. The overall F-ratio for the full model was 2.6936 and was significant at the .05 level. The R^2 was .32, and the $\bar{R}^2$ was equal to .20. In the restricted model obtained through step-down technique, only GATB-N and Vocational

Maturity were found to be significant. The overall F-ratio for the restricted model was found to be equal to 16.4057 which is significant beyond the .05 level. The R^2 was .24, and the $\bar{R}^2$ was .22. O'Reilly further found that GATB-V, GATB-Q, and GATB-M predicted a significant portion of 10th grade shop grades. The overall F-ratio was 2.472, and the R^2 was .28. The $\bar{R}^2$ was .156. Step-down technique uncovered five variables, GATB-V, GATB-N, GATB-Q, GATB-K and GATB-M, to be unique and significantly useful in predicting 10th grade shop grades. The restricted model yielded an F-ratio of 5.8460 which is significant beyond the .05 level. The R^2 was .22, and the $\bar{R}^2$ was .183. With the full model, only GATB-V and Salary were found to be significant predictors of 11th grade GPA. The overall F-ratio equaled 4.2713 which was found to be significant. The R^2 was found to be .44, and the $\bar{R}^2$ was equal to .33. The restricted model for prediction of 11th grade GPA retained GATB-V, GATB-N, Salary, and Vocational Maturity. The overall F-ratio was 14.9580 and was significant beyond the .05 level. The R^2 was .37, and the $\bar{R}^2$ was .3493. Salary and Vocational Maturity were found to be full model predictors of 11th grade shop grades. A significant overall F-ratio of 3.4671 was obtained. The R^2 yielded a value of .39, and the $\bar{R}^2$ was equal to .2751. GATB-V, Salary, and Vocational Maturity were found to possess enough useful and unique information to remain in the restricted model. The overall F-ratio was 17.5402, and the R^2 was .34. The $\bar{R}^2$ was found to be .3230.

III

PROCEDURE

The following information describes in detail the method to be used in this investigation. Areas to be discussed include: population and sample, independent variables, dependent variable, and data analysis.

Population and Sample

The population from which the present sample was drawn consists of the 1972 graduating class of Altoona High School. Altoona is located in south central Pennsylvania in Blair County and was founded as a railroad community. The economy of Altoona was mainly supported by the railroad until the end of World War II. Beginning in 1930, there was an out-migration from the city which decreased the population from 82,054 to 80,214 in 1940. The skilled labor force available in Altoona was instrumental in shifting the economic base from railroading to diversified manufacturing and industry causing a decline in the unemployment rate from 1961 to the present approach to almost full employment. This relocation of the economic base of the community has been influential in the projections showing an upward population trend from the present 62,900 to 87,700 by the year 2000.

Approximately 50 percent of the manufacturing employment in Altoona is in firms that are relatively insensitive to changes in the business cycle influencing the stability of the economy. Persons employed in manufacturing in the Altoona Standard Metropolitan Statistical Area increased by 7,900 between 1950 and 1969, a growth of 110 percent. Since

1963, the Altoona per capita and family income have increased at a rate greater than the national average.

Altoona's total land area is 9.1 square miles, approximately 80 percent of this area being developed. Land use developed around the railroad which was the original main source of transportation. Planned limited access Route 220 and Route 22 relocation in the Altoona area will increase Altoona's accessibility and should be a boon to economic growth.

The ethnic makeup of Altoona represents most European nationalities with only approximately two percent of the population being non-white. The median family income in Altoona in 1969 was near $8,100, lower than the average Pennsylvania city of similar size by $1,600. The age composition of Altoona consists of 31 percent 18 years of age and under, 54 percent 18 to 64 years of age, and 14 percent over 65. The 1971 unemployment figures placed Altoona's unemployment rate at 5 3/4 percent.

The Altoona Area School District includes Altoona, Logan Township, and the southern part of Tyrone Township. A 1968-1969 survey revealed a shortage of educational accommodations at all levels. Altoona Area High School was functioning 40 percent above capacity. The opening of the Altoona Area Vocational-Technical School in 1970 helped to ease this situation. The new Area Vocational-Technical School (AVTS) is expected to significantly influence industrial development and economic growth since Altoona no longer has a surplus of skilled people in the labor supply. In the 1968-1969 school year, there were approximately 14,000 students in the public school system. Altoona Area High School, serving grades 10 through 12, had 3,300 pupils. Altoona is also the location for one of Penn State's 21 branch campuses providing a two year

associate degree program and enrolling 700 full-time students and 2,100 students in continuing education.

The population from which the present sample was drawn consists of all male graduates of the Vocational and Academic curricula in 1972 in the city of Altoona, Pennsylvania. The entire 1972 graduating class consisted of 1031 males and females. In the spring of 1973, these students were mailed a one year follow-up questionnaire as part of the 10 year longitudinal study being conducted by the Vocational Development Study (VDS) project in the Department of Vocational Education at Penn State. Of these respondents, 39 male Vocational graduates were presently employed and 75 male Academic graduates were employed. Of the 39 Vocational graduates, only 29 of the employers of these graduates could be contacted. A random sample of 35 Academic students was taken, and their employers were contacted. All of the employers were contacted by telephone and requested to fill out the Minnesota Satisfactoriness Scale ranking their employee's performance on the job. All employers contacted agreed to complete the questionnaire. Questionnaire response was 71%, resulting in a sample consisting of 30 male Academic graduates and 25 male Vocational graduates for Question I.

Vocational and Academic students were combined in the analysis for Question 2 giving 55 students. Fourteen students were lost to the sample because of insufficient data in their personal records. Of the remaining 41 people retained in the sample, eleven were missing one variable and one was missing two independent variables. In all cases where a piece of information was missing, the mean for the entire group was substituted. One substitution was made for Vocational Maturity; four substitutions were made for Father's Education Level; and eight

substitutions were made for Realistic Occupational Aspiration. To compensate for this data substitution, appropriate adjustments were made in the degrees of freedom used.

Independent Variables

The rationale for the original selection of the following student characteristics was developed by Impellitteri and Kapes (1971a). The present study will use those variables found by Kapes to be significantly related to in-school success as measured by Grade Point Average (Kapes, 1971, pp. 123-125).

a) ABILITY MEASURES - The General Aptitude Test Battery (GATB) which was developed by the United States Employment Service (USES) in 1947 was choosen by the VDS project to measure abilities because of its appropriateness for Vocational as well as Academic students. The GATB has also been choosen by the Work Adjustment Project at the University of Minnesota for use in testing abilities in relation to the Work Adjustment Theory.

The battery takes approximately two and one quarter hours to administer and consists of 12 subtests which yield the following aptitude scores:

G - Intelligence--General learning ability. The ability to "catch on" or understand instructions and underlying principles; the ability to reason and make judgements. Closely related to doing well in school.

V - Verbal Aptitude--The ability to understand meaning of words and to use them effectively. The ability to comprehend language, to understand relationships between words and to understand meanings or whole sentences and paragraphs.

N - Numerical Aptitude--Ability to perform arithmetic operations quickly and accurately.

S - Spatial Aptitude--Ability to think visually of geometric forms and to comprehend the two-dimensional representation of three-dimensional objects. The ability to recognize the relationships resulting from the movement of objects in space.

P - Form Perception--Ability to perceive pertinent detail in objects or in pictoral or graphic material. Ability to make visual comparisons and discriminations and see slight differences in shapes and shadings of figures and widths and lengths of lines.

Q - Clerical Perception--Ability to perceive pertinent detail in verbal and tabular material. Ability to observe differences in copy, to proofread words and numbers, and to avoid perceptual errors in arithmetic computation.

K - Motor Coordination--Ability to coordinate eyes and hands or fingers rapidly and accurately in making precise movements with speed. Ability to make a movement response accurately and swiftly.

F - Finger Dexterity--Ability to move the fingers and manipulate small objects with the fingers, rapidly or accurately.

M - Manual Dexterity--Ability to move the hands easily and skillfully. Ability to work with the hands in placing and turning motions.

Two of the nine GATB aptitudes were used in this study based on Kapes' findings (1971) that Verbal Aptitudes (V) and Numerical Aptitude (N) were significantly related to in school success (GPA).

b) OCCUPATIONAL VALUES - The Occupational Values Inventory (OVI) developed by Impellitteri and Kapes at Penn State (Impellitteri and Kapes, 1971b) was used to measure occupational values through actual "valuing tasks" in an ipsative format. The following seven values are assessed by the OVI:

1. Interest and Satisfaction--One likes the work; enjoys it; is happy at it; fulfills oneself by doing it.

2. Advancement--One perceives the opportunity to get ahead in the work; sees a good future in it; it provides an opportunity to improve oneself.

3. Salary--One perceives the financial return resulting from the work; can make a good living at it; sees it as an opportunity for a good income.

4. Prestige--One is impressed by the respectability attached to the work; can earn recognition from it; desires the feeling of importance that goes with it.

5. Personal Goal--One sees the work as fitting into his way of life; is what one always wanted to do; has been shooting for it; it's the ideal.

6. Preparation and Ability--One can succeed in the work; is good at it; it's where one's talents lie; is suited to it.

7. Security--One can obtain employment in this work; perceives that workers are needed in it; there will always be openings in it.

Of these seven values, three (Interest and Satisfaction, Salary, and Prestige) were chosen for use in the present study based on the findings from previous research (Kapes, 1971; O'Reilly, 1972; and McAlister, 1973).

c) VOCATIONAL MATURITY - One of the first constructs to evolve from Super's research in the Career Pattern Study (CPS) was Vocational Maturity.

> Vocational Maturity is used to denote the degree of development, the place reached on the continuum of vocational development from exploration to decline. Vocational maturity may be thought of as vocational age, conceptually similar to mental age in early adolescence, but practically different in late adolescence and early adulthood because more distinctions can be made in the developmental curve at those stages (Super, 1957, p. 186).

The Vocational Development Inventory (VDI) was developed by Crites (1965, 1969) to measure Vocational Maturity. It is a 50 item test yielding a single score which will be used on this study to represent Vocational Maturity.

d) FAMILY BACKGROUND MEASURES - For the purposes of this study, Father's Educational Level which was found to be significantly

related to in school success (GPA) by Kapes (1971) will be used to represent family background information. Educational Level has been recorded according to the following seven categories: 1) one year through six years; 2) seven years through nine years; 3) ten years through eleven years; 4) high school graduate--twelve years; 5) one year through three years of college; 6) college graduate; 7) college graduate plus additional graduate studies.

e) OCCUPATIONAL ASPIRATIONS - The answer to the question "What occupation do you realistically believe you will enter?" was selected for use in this study and was coded according to the six levels of Roe's classification scheme. Roe's levels, ranging from highest to lowest, are: 1) Professional and Managerial 1, 2) Professional and Managerial 2, 3) Semi-Professional and Small Business, 4) Skilled, 5) Semi-Skilled and 6) Unskilled. Occupational aspiration was found to be significantly related to in-school success (Kapes, 1971) and was used in this study of on-the-job success.

Dependent Variable

Satisfactoriness as measured by the Minnesota Satisfactoriness Scale is the criterion variable selected for this study of on-the-job success. The Minnesota Satisfactoriness Scale consists of employer ranking of the employee in comparison to co-workers or others who have held the same position. The scale consists of 28 items, 27 of which are in a Likert format rating the employee below average, average, or above average. The 28th item consists of ranking the employee according to

that quarter which would best describe his performance in comparison to other workers ranging from lowest 1/4 to highest 1/4 of workers.

The Minnesota Satisfactoriness Scale is scored on five separate scales: general satisfactoriness, performance, conformance, dependability, and personal adjustment. These five scales are obtained by scoring different sets of items. General satisfactoriness is based on 27 of the 28 items. Performance is based on promotability and competence, adaptability, and quality and quantity of work output. Thus, performance is a measure of how well the employee handles his work. Conformance is a measure of the employee's willingness to accept limitations imposed on him by his job and his employer. Conformance also includes the degree of cooperativeness the worker shows toward coworkers and supervisor. Personal adjustment is a measure of maladjustment stressing emotional or mental health. Dependability is a measure of disciplinary problems and poor work habits. Included in dependability are measures of absenteeism and tardiness.

In order for the Minnesota Satisfactoriness Scale to be successfully completed, the evaluating supervisor must be familiar with the employee being evaluated. He must also be familiar with the workers with whom he is being compared. In cases where only one individual holds a certain position, the evaluater must be familiar with the performance of those who have done the job in the past. All questions must be answered, and only one response per item may be permitted. The first 27 items range from a high of 3 to a low of 1. The 28th item ranges from 4 to 1. Thus the total possible range of scores is 28 to 85. Raw scores may be converted to percentiles by using an appropriate norm scale; however, the original raw scores were used in the present study.

Scales are available for Workers-in-General to compare workers in different fields and also for many specific occupations to compare workers within one field. Percentile rankings of below or equal to 25 are considered poor Satisfactoriness ratings. Rankings from the 26th to the 74th percentile are considered average Satisfactoriness. Rankings above the 75th percentile are high Satisfactoriness ratings. Average Satisfactoriness can be further subdivided into somewhat satisfactory (26-49) and satisfactory (50-74).

To compensate for inconsistencies in interrater reliability, confidence bands can be constructed on the percentile scores achieved on the Minnesota Satisfactoriness Scale. "If it were possible to have 100 immediate supervisers each fill out an MSS on a particular worker, not all of them would be likely to answer the questions in the same way" (Gibson, et al., 1970, p. 4). Raw score totals are likely to show some variation forming a distribution for which a mean and a standard deviation could be calculated. About two thirds of the raw scores would fall within one standard deviation of the mean. This range is the confidence band. The Standard Error of Measurement (S.E.M.) for an individual norm scale has been calculated, and this quantity can be added to and subtracted from the raw scores before entering the norm table for percentile conversion. The upper limit raw score and the lower limit raw score can then be converted to percentiles through the appropriate norm conversion table resulting in a confidence band of percentiles which will compensate for inconsistency in interrater reliability.

Based on superviser ratings of 2,373 workers, the median Hoyt reliability coefficient was found to be .87 for the Minnesota

Satisfactoriness Scale. The median test-retest reliability for several job groups over a two year interval was .50. The scale intercorrelations with general satisfactoriness ranged from .74 to .90 due to part-whole correlations. The four specific scales intercorrelated with each other less highly, ranging from .45 to .70. The median intercorrelations, .50, suggests the possibility of a "halo effect" in the way raters use the MSS (Gibson, et al., 1970, p. 23).

Analysis

The Statistical methodology used in this study was two fold. Question #1 was answered by using an independent pooled variance t-test with a Behrens-Fisher solution comparing the mean of group one to the mean of group two. Question #2 was answered by using multiple regression analysis (MRA).

The multiple regression model used in answering Question #2 is the same model used by Kapes (1971), O'Reilly (1972), and McAlister (1973). This model is of the following form:

$$y = b_o + b_1x_. + b_2xb_2 + \ldots + b_kx_k + e$$

where

y = dependent variable

$x_1, x_2 \ldots x_k$ = independent variables

$b_o, b_1, b_2 \ldots b_k$ = partial regression coefficients

e = error term

The particular equation used here is:

$$y = b_o + b_1x_1 + b_2x_2 + \ldots + b_8x_8 + e$$

where

y = employer evaluation of performance on the Minnesota Satisfactoriness Scale (a continuous variable)

and

x_1 = GATB - Verbal Aptitude (V)

x_2 = GATB - Numerical Aptitude (N)

x_3 = Occupational Value--Interest and Satisfaction

x_4 = Occupational Value--Salary

x_5 = Occupational Value--Prestige

x_6 = Vocational Maturity

x_7 = Father's Educational Level

x_8 = Occupational Aspiration Level

Through the use of multiple regression analysis it is possible to partial out the effects of k-1 independent variables which results in the isolation of the unique contribution to the dependent variable made by the kth independent variable. This unique contribution holds true only for that exact set of k variables included in the equation. The addition or subtraction of variables to this set would result in a redistribution of the explainable variance among the new set of independent variables. The meaningfulness of the partial regression coefficients are dependent upon the theoretical meaningfulness of the variables included in the equation. With this consideration in mind, the variables included in the investigation have been selected.

The assumptions required for the use of MRA are that: (Li, 1967, p. 95).

1. Each array of Y of the population follows the normal distribution.
2. The regression of Y on X_1, $X_2 \ldots X_k$ is linear.

3. The variances of all arrays of Y of the population are equal.

4. The samples are drawn at random.

5. The X values remain constant for all samples.

The significance of the overall multiple R was tested using the F-distribution with k and N-k-1 degrees of freedom. This results in a test of the general null hypothesis that all k partial regression coefficients are equal to zero. If the overall F was found to be significant and all partial regression coefficients were not equal to zero, each partial regression coefficient was tested using the F-distribution with 1 and N-k-1 degrees of freedom. This results in a test of the hypothesis that $B_k = 0$. Alpha levels of .05 and .01 were used in describing each variable's probable departure from a zero relationship.

Finally, a restricted model containing only those variables making a significant unique contribution to explaining the criterion variable was calculated using a step-down technique and tested as indicated previously.

A number of studies have been undertaken which demonstrate the usefulness of this particular methodology. Kaufman, et al. (1967) have applied this approach to cost-benefit studies of Vocational Education. Moss (1968) has suggested its use in program evaluation and Impellitteri and others (1969), and Kapes (1969) have explored its use in career development research.

The computer program selected for this analysis was written by Hallberg (1969) and is available under the title of QSASE at the Penn State Computation Center. This program also provides for a test of the statistical significance of each partial regression coefficient as well as the overall F test.

IV

FINDINGS

Introduction

The findings of this study are reported in this section as they relate to the specific questions posed in the statement of the problem. The results are presented in the same order as they appeared in the statement of the problem. All statistical information is presented in table form and is discussed only to the extent necessary to explain and interpret the meaning of the statistics used. All conclusions supported by this data are reported and discussed in the following chapter.

Before considering the questions posed in the statement of the problem, Table 1 is presented to help provide background information concerning the nine variables (eight independent and one dependent) used in this study. These data were obtained from the adjusted sample, excluding those students who did not have several of the independent variables under consideration available on their records.

Table 1 lists the means and standard deviations for each of the nine variables being considered. Although the expected values for an adult population for the GATB variables are 100 units for the mean and 20 units for the standard deviation, the lower means and standard deviations for the present sample should not be interpreted to indicate that this group falls below their peers nationally because the means and standard deviations reported are approximately normal for the age group being sampled.

Father's Occupational Level has been coded according to the seven levels used in previous VDS studies, ranging from a low of 1 to a high

Table 1. Means and Standard Deviations for the Nine Variables (Eight Independent and One Dependent) for the Total Sample (N=41)

Variable	Variable Number	Mean	Standard Deviation
GATB-V	1	91.634	10.805
GATB-N	2	94.634	9.607
Father's Education Level[a]	3	3.732	.743
Occupational Aspiration Level[b]	4	4.756	2.256
VDI	5	33.415	6.140
OVI - Interest and Satisfaction	6	18.268	4.653
OVI - Salary	7	17.244	6.902
OVI - Prestige	8	9.000	5.775
Minnesota Satisfactoriness Scale	9	62.805	12.057

[a]This variable is coded according to the seven categories described on page 35.

[b]This variable is coded according to the six levels of Roe's model described on page 37.

of 7. Occupational Aspiration Level has been coded according to the six levels of Roe's classification scheme, ranging from a low of 6 to a high of 1. Based on this system, the lower the number, the higher the level. Vocational Maturity, as measured by Crites' Vocational Development Inventory (VDI), has a score range from a low of 0 to a high of 50.

The descriptive statistics for the three selected occupational values as measured by the Occupational Values Inventory (OVI) are consistent with previous norms for Interest and Satisfaction; slightly higher for Salary; and somewhat lower than the norms for the value, Prestige (Impellitteri and Kapes, 1971b).

The dependent variable, Minnesota Satisfactoriness Scale (MSS), has a score range from a low of 28 to a high of 85. The mean and standard deviation for the sample are consistent with the norms for Workers-in-General (Gibson, et al., 1970).

Question #1

> Does the Vocational or Academic curriculum more adequately prepare students for work adjustment approximately one year after high school graduation as measured by job Satisfactoriness?

The mean raw scores and t-value for Vocational and Academic employed graduates of Altoona High School on the Minnesota Satisfactoriness Scale (MSS) are reported in Table 2. The mean raw score for Vocational graduates on the MSS was 61.240, and the mean for Academic graduates was 63.200. There were 25 Vocational graduates in the sample compared with 30 Academic graduates. The standard deviation for

Table 2: Mean Raw Scores and t-values for Vocational and Academic Employed Graduates on the Minnesota Satisfactoriness Scale

Group	Mean Raw Score	Standard Deviation	t-value	Probability
1. Vocational Graduates N = 25	61.240	14.057		
			-0.571	.571
2. Academic Graduates N = 30	63.200	10.791		

Academic students was 10.791, and the standard deviation for Vocational students was 14.057. All graduates in the sample were male.

The Behren's Fisher t-test with pooled variance was used to test the null hypothesis that the two samples come from populations with equal means. The Behrens-Fisher t-test was selected because it does not assume any knowledge of the population variances. It deals successfully with testing the significance of the difference between two means, $\overline{X}_1 - \overline{X}_2$, when the population variances are unequal (Glass and Stanley, 1970, p. 297). Because the standard t-test is non-robust when the assumption of homogeneous variance is not met when using small or unequal n's, the Behrens-Fisher t was used.

This statistic has been found to provide excellent control of Type I errors with n's as small as 4 (Games, 1972, p. 10). At the same time, the power of the Behrens-Fisher statistic is barely below the power of the standard t statistic.

The Behrens-Fisher statistic was selected for this study because the population variances are unknown and the sample sizes are unequal. The Behrens-Fisher t-value obtained is -0.571 which is not significant at the .05 level. In order to be significant at the .05 level, a critical value of 2.021 is needed. Therefore, although the Academic graduates obtained a slightly higher mean on the MSS than the Vocational graduates, it is appropriate to conclude that the two groups experienced approximately equal Satisfactoriness. According to the MSS norms for Workers-in-General, Vocational students ranked in the 35th percentile on Satisfactoriness ratings, and the Academic students ranked in the 40th - 45th percentile. These Satisfactoriness ratings are considered to be in the "somewhat satisfactory" range for Workers-in-General.

Question #2

What is the relationship between each of the following ninth grade student characteristics and job Satisfactoriness approximately one year after graduation from high school?

a. abilities
b. occupational values
c. vocational maturity
d. family background
e. occupational aspirations

Table 3 represents these variables in terms of their relationship to each other. It also shows the relationship between the independent variables and the criterion variable. As shown in Table 3, only the occupational value, Salary, is significantly related to the dependent variable, Minnesota Satisfactoriness Scale (MSS), at the .05 level. This

Table 3. Zero-Order Correlations Among Nine Variables (Eight Independent Variables and One Dependent Variable, Minnesota Satisfactoriness Scale) for the Adjusted Sample (N=41)

Variables	1	2	3	4	5	6	7	8
1. GATB-V								
2. GATB-N	.385							
3. Father's Education Level	.118	-.737						
4. Occupational Aspiration	-.266	-.286	-.040					
5. VDI	.462	.217	.020	-.325				
6. OVI-Interest and Satisfaction	.291	-.016	.217	.066	.392			
7. OVI-Salary	-.314	-.238	-.192	.087	-.139	-.544		
8. OVI-Prestige	-.135	-.337	.035	.305	-.506	-.266	.055	
9. Minnesota Satisfactoriness Scale	.270	.225	-.087	-.130	-.129	-.041	.321	.001

Note: $r \geq .304$ Significant at .05 level

relationship is positive, and there are no other significant relationships between any of the remaining seven independent variables and the dependent variable. Table 3 contains the zero-order correlations among the eight independent and one dependent variable for the adjusted sample. From this table, it can be seen that the intercorrelations among the variables range from -.732 to .462. Many of the relationships are statistically significant; however, the greatest amount of shared variance is equal to 37 percent with most of the relationships yielding much lower values. The information provided in this table concerns the variables which were used in the MRA to ascertain the total amount of useful and unique information available to answer Question 2.

The results of the full model analysis are presented in Table 4. The total multiple correlation (R) obtained from this analysis is equal to .706. The unadjusted coefficient of determination (R^2) is equal to .499. Adjusting the coefficient of determination for degrees of freedom accounts for the shrinkage which could be expected upon cross-validation. The coefficient of determination adjusted for degrees of freedom ($\bar{R}^2$) is approximately equal to .373.

The significance of the total relationship, the overall multiple R, was tested by using the F-ratio with k and N-k-2 degrees of freedom. The value N-k-2 degrees of freedom was used instead of N-k-1 degrees of freedom to compensate for the loss of one degree of freedom because the group mean was substituted for one piece of missing data in thirteen cases. In five cases, one substitution was made for missing data in the Academic sample. Six substitutions for one missing piece of data were made in the case of Vocational graduates. There was also one Vocational student with two missing pieces of information for which substitutions

Table 4. Regression Analysis Between the Eight Independent Variables in the Full Model and the Dependent Variable, Minnesota Satisfactoriness Scale, for Employed Graduates (N=41)

Variables No.	Name	Partial Regression Coefficient	Standard Error	Student "t"
1.	GATB-V	.498	.180	2.771**
2.	GATB-N	.369	.195	1.885
3.	Father's Educational Level	-1.353	2.125	.637
4.	Occupational Aspiration	-1.121	.773	1.451
5.	VDI	-1.034	.341	3.032**
6.	OVI - Interest and Satisfaction	1.222	.472	2.590*
7.	OVI - Salary	1.247	.288	4.326**
8.	OVI - Prestige	.098	.340	.287
	Intercept	-17.520	27.902	

Standard Error of Estimate = 9.545

Multiple Correlation = .706

Coefficient of Determination $(R^{-2})^a = .373$

Overall F-Ratio $\frac{(MSR)}{(MSE)} = 3.852^{**}$

Note: [a]Adjusted for Degrees of Freedom

*Significant at .05

**Significant at .01

were made. In the adjusted sample, there were eighteen Vocational students and twenty three Academic students. The F-ratio is obtained by dividing the mean squares regression (MSR) by the mean squares error (MSE). The overall F-ratio for this model is 3.852 and is significant beyond the .01 level.

The partial regression coefficient represents that portion of each independent variable which is uniquely associated with the employer rating on the Minnesota Satisfactoriness Scale (MSS) with the effect of all of the other seven independent variables partialled out. A student "t" value is obtained by dividing this partial regression coefficient by the standard error of the partial regression coefficient. The obtained student "t" value is then compared to a tabled value of "t" with 1 and N-k-1 degrees of freedom to test the probable departure of the partial regression coefficient from a zero relationship with the criterion. The degrees of freedom N-k-2 was used instead of N-k-1 to compensate for the loss of one degree of freedom because the group mean was substituted for one piece of missing data in thirteen cases. In the case of Vocational Maturity which was significant in the full model and for which one substitution was made, the degrees of freedom were equal to 31 based on the N-k-2 formula. Other corrections for degrees of freedom were four substitutions for Father's Educational Level and eight substitutions for Occupational Aspiration; however, neither of these two variables were retained in either the full or restricted model resulting in no additional effect on degrees of freedom.

Following this procedure, three of the eight independent variables were found to be significant at the .01 level. A fourth independent variable was found to be significant at the .05 level. GATB-V;

Vocational Maturity (VDI); and the occupational value, Salary, were significant at .01. The occupational value, Interest and Satisfaction, was significant at .05. The remaining four variables did not possess enough of a unique contribution to be statistically significant. However, all eight independent variables taken together account for approximately 37 percent of the variance in the dependent variable, Minnesota Satisfactoriness Scale (MSS). The 37 percent figure is obtained from the adjusted coefficient of determination ($\bar{R}^2$).

In order to discover which variables possess the most information which is unique and useful for prediction, a restricted model was calculated. The restricted model is obtained by successively omitting the least contributing independent variable until the regression coefficients on all remaining variables are significantly different from zero at the .05 level.

Table 5 provides the results of the restricted model analysis. The overall F-ratio calculated for the restricted model is 5.313 and is significant beyond the .01 level. The multiple correlation for the restricted model is .679. The adjusted coefficient of determination ($\bar{R}^2$) is .385. The variables remaining in the restricted model are: GATB-V; GATB-N; Vocational Maturity as measured by the VDI; and the occupational values, Interest and Satisfaction, and Salary. GATB-V; GATB-N; and the occupational values, Interest and Satisfaction, and Salary were positively related to the criterion variable, MSS. Vocational Maturity, as measured by Crites' VDI, was negatively related to the MSS.

Table 5. Regression Analysis Between the Five Independent Variables in the Restricted Model and the Dependent Variable, Minnesota Satisfactoriness Scale, for Employed Graduates (N=41)

Variables No.	Name	Partial Regression Coefficient	Standard Error	Student "t"
1.	GATB-V	.522	.170	3.065**
2.	GATB-N	.395	.178	2.223*
5.	VDI	-.918	.297	3.092**
6.	OVI - Interest and Satisfaction	.993	.432	2.300*
7.	OVI - Salary	1.198	.278	4.309**
	Intercept	-30.545	22.028	

Standard Error of Estimate = 9.459

Multiple Correlation = .679

Coefficient of Determination $(R^{-2})^a$ = .385

Overall F-Ratio $\frac{(MSR)}{(MSE)}$ = 5.313**

Note: [a]Adjusted for Degrees of Freedom

*Significant at .05

**Significant at .01

V

SUMMARY, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

Chapter V contains a summary of this study, conclusions based on the findings, implications for Work Adjustment Theory, and recommendations for further study.

Summary

Introduction

Vocational education has taken many forms throughout history but has remained concerned with man's attempt to learn to work and to pass this knowledge on to succeeding generations. Much current research has been concerned with decisions upon which current career choices can be based which will lead to success and satisfaction. In the 1930's, research conducted by Thorndike and Hoppock lead to interest in the area of job satisfaction and adjustment. Work adjustment is now considered to be composed of a Satisfaction element and a Satisfactoriness (success) element. Consistent with the Theory of Work Adjustment developed at the University of Minnesota, Satisfactoriness or the employer's extrinsic evaluation of employee performance has been considered in this study as one aspect of work adjustment and vocational development.

This study was concerned with those male students from both the Academic and Vocational curricula who terminated their education with high school graduation and found employment. It was undertaken as a part of the Vocational Development Study (VDS) project at Penn State and

used the same student population and many of the same variables used in previous VDS studies conducted by Kapes (1971), O'Reilly (1972), and McAlister (1973). Other studies concerning the post high school employability and related job success of recent high school graduates have been conducted in conjunction with the ongoing Work Adjustment Project at the University of Minnesota.

Statement of the Problem

The present study has used the Minnesota Satisfactoriness Scale developed in conjunction with the Work Adjustment Project to measure employer ratings of employee performance. The study was further concerned with identifying variables which would predict on-the-job success. The two questions considered in this study were:

1. Does the Vocational or Academic curriculum more adequately prepare students for work adjustment approximately one year after high school graduation as measured by job satisfactoriness?
2. What is the relationship between each of the following ninth grade student characteristics and job satisfactoriness approximately one year after graduation from high school?
    a. abilities
    b. occupational values
    c. vocational maturity
    d. family background
    e. occupational aspirations

Procedure

The sample used in this study consisted of male Vocational and Academic students graduated from Altoona High School in 1972 who had completed a one year follow-up questionnaire, who were employed, and whose employers completed the Minnesota Satisfactoriness Scale (MSS). The sample consisted of 25 Vocational graduates and 30 Academic graduates. The combined sample of 55 students was reduced to 41 due to lack of information in 14 students' records.

The criterion data, Minnesota Satisfactoriness Scale (MSS), was collected in the Spring of 1973. The independent variables, obtained from the students' high school records, included GATB aptitudes (Verbal and Numerical), Father's Education Level, Occupational Aspiration Level, Vocational Maturity as measured by the Vocational Development Inventory (VDI), and three occupational values (Interest and Satisfaction, Prestige, and Salary) measured by the Occupational Values Inventory (OVI). This information was collected as a part of the longitudinal Vocational Development Study (VDS) project in the Department of Vocational Education at Penn State.

The statistical approaches used to analyze the data were an independent pooled variance t-test and multiple regression analysis (MRA). MRA was conducted with both the full model and the restricted model based on a step-down technique.

Findings

The mean raw score for male Vocational graduates on the Minnesota Satisfactoriness Scale (MSS) was 61.240, and the mean for male Academic graduates was 63.200. The standard deviation for Academic males was

10.791, and the standard deviation for Vocational males was 14.057. The Behrens-Fisher t-value was -0.571 and was not significant at the .05 level.

Zero-order correlations were calculated among the eight independent variables and between each of these eight variables and the dependent variable. The range of the overall intercorrelations among the eight independent variables was from -.732 to .462. The correlation between the independent variables and the criterion ranged from -.130 to .321.

Using MRA, the eight independent variables in the full model yielded a multiple R of .706 with the dependent variable, MSS. The adjusted coefficient of determination ($\bar{R}^2$) was equal to .373. The overall F-ratio calculated to test the general null hypothesis that k partial regression coefficients were equal to zero was significant beyond the .01 level. The restricted model yielded an $\bar{R}^2$ of .385 with the following variables being the significant unique predictors of Satisfactoriness: GATB-V; GATB-N; Vocational Maturity; and the occupational values, Interest and Satisfaction, and Salary.

Conclusions

Question #1

Question number one compared the male graduates of the Vocational and Academic programs to see which curriculum more adequately prepared students for work adjustment approximately one year after high school graduation as rated by the employers on the MSS. Vocational graduates had a mean raw score on the MSS of 61.240 with a standard deviation of 14.057. Academic graduates had a mean raw score of 63.200 and a standard deviation of 10.791. The probability of these scores occurring by

chance was .571 based on the Behrens-Fisher t-value. Therefore, neither curriculum can be assumed to better prepare male students for employment one year after graduation.

Previous research conducted by E. L. Thorndike (1934) pointed to little correlation between in-school variables and later vocational success. Perhaps curriculum becomes relevant to work adjustment only after workers have advanced to jobs in which success depends on earlier educational experience (C ites, 1969). Possibly, as concluded by Thorndike (1934), the experience and skills necessary for success may be obtained on the job.

In conclusion, neither the Academic nor the Voc: ional curriculum can be said to better prepare male graduates for employment one year after high school graduation based on the employer's evaluation of Satisfactoriness.

Question #2

This question is concerned with determining those in-school characteristics which are related to on-the-job success as viewed by the employers of recent male Academic and Vocational high school graduates as measured by the Minnesota Satisfactoriness Scale (MSS). The zero-order correlations reported in Table 3 indicated that the occupational value, Salary, was the only independent variable significantly correlated with the dependent variable, MSS, at the .05 level.

When MRA was conducted between each of the eight independent variables and the criterion, MSS, the multiple correlation obtained was .706 while the adjusted coefficient of determination ($\bar{R}^2$) was equal to .373. The results of the restricted model indicated that five of the

eight independent variables (GATB-V; GATB-N; VDI; and the occupational values, Interest and Satisfaction, and Salary) provided most of the available unique information. The multiple correlation for the restricted model was equal to .679. The $\bar{R}^2$ was .385 which was slightly greater than the $\bar{R}^2$ in the full model.

E. L. Thorndike (1934) found aptitudes to be related to in-school success but not to on-the-job success. Recent studies conducted in conjunction with the VDS project have, however, found the same variables used in this study to be related to in-school success. GATB-V has been found to be related to Academic and Vocational 10th grade Grade Point Average (GPA) for both males (Kapes, 1971) and females (McAlister, 1963). O'Reilly (1972) found GATB-V to be related to 10th and 11th grade shop grades and 11th grade GPA. Kapes (1971) found GATB-N to be a predictor of the 10th grade Academic and Vocational GPA of male students. Similarly, GATB-N was found to be a significant predictor of 10th grade Vocational and Academic GPA for females (McAlister, 1973). O'Reilly (1972) found GATB-N to be a predictor of 10th and 11th grade GPA and 10th grade shop grades.

Vocational Maturity was found to be negatively related to on-the-job success in opposition to the findings of previous studies. Cox (1971) found no significant correlations between Vocational Maturity and on-the-job success for total sample, trade-technical school males, or business school males. The Vocational maturity of business school females, on the other hand, was found to be significantly positively related to on-the-job success. Ghiselli and others found maturity of self-perception, similar to Vocational Maturity, to be significant and positively related to vocational success (Ghiselli, 1964; Ghiselli and

Barthol, 1956). Further, Vocational Maturity was found to be positively related to in-school success in previous Vocational Development Study (VDS) research. Kapes (1971) found Vocational Maturity to be significantly and positively related to the GPA of 10th grade Academic males. McAlister (1973) found Vocational Maturity to be related to both Academic and Vocational 10th grade GPA for female students. O'Reilly (1972) found Vocational Maturity to be positively related to 10th and 11th grade GPA and 11th grade shop grades. Thus, according to the present study, workers who possessed a high degree of Vocational Maturity in ninth grade were considered to be poorer workers one year after graduation than those who exhibited low Vocational Maturity.

In the case of the OVI variable, Interest and Satisfaction, the correlation matrix contained both low and high relationships with the other independent variables. In the matrix, Interest and Satisfaction exhibited a low negative correlation with the criterion variable, MSS. However, in both the full and restricted MRA models, Interest and Satisfaction appeared as a high positive predictor of MSS. The presence of the other independent variables in the correlation matrix appears to have confounded the relationship of the variable, Interest and Satisfaction. Thus, the true relationship of Interest and Satisfaction with MSS is not possible to determine from the analysis.

Previous VDS studies have shown the occupational value, Salary, to be significantly related to in-school success. McAlister (1973) found the occupational value, Salary, to be significantly related to the 10th grade Academic GPA of females. O'Reilly (1973) found Salary to be significantly related to 11th grade GPA and shop grades. In the present study, Salary was the largest positive predictor of on-the-job success.

It contributed the largest amount of unique and explainable variance to both the full and restricted MRA models.

Conclusions concerning the relationship between the eight independent variables and on-the-job success as measured by the Minnesota Satisfactoriness Scale (MSS) are:

1. Although only one of the variables correlates significantly with the criterion, all of the variables taken together account for 38 percent of the variance associated with the MSS, and five of these variables possess most of the unique information available from the initial eight variables.
2. On-the-job success as measured by the MSS is uniquely and positively related to GATB-V; GATB-N; and the occupational value, Salary.
3. While the value Interest and Satisfaction appears to have an important relationship to Satisfactoriness, the exact nature of this relationship is not determinable from the results of this study.
4. On-the-job success as measured by the MSS is uniquely and negatively related to Vocational Maturity as measured by the VDI.
5. All of the variables which were found to be significant predictors of on-the-job success have previously been found to be significantly related to in-school success; however, Vocational Maturity is negatively related to on-the-job success in this study.

Implications

There does not appear to be a significant difference in the preparation of male graduates of the Vocational and Academic curricula for on-the-job success as viewed by the employer one year after graduation. On the basis of this finding, it can be seen that these two curricula share equally in responsibility and ability to prepare students for work immediately upon graduation. Neither curriculum is superior in training students for the world of work immediately upon graduation. However, as concluded by E. L. Thorndike (1934), these differences may only become important when workers have advanced to positions in which success depends on earlier educational experience. Based on the Academic graduates, lack of specific skill training in high school and their ability to function on a par with those students receiving skill training in the Vocational curriculum, it is possible that skills which lead to immediate success are learned on the job. On the other hand, there may be personality differences or other factors which compensate for the Academic graduates' lack of skill training in the eyes of the employer similar to the findings of Anderson (1949), Super and Crites (1962), and Crites (1969). No matter what the reasons, Vocational and Academic graduates perform equally well on-the-job one year after graduation based on employer's evaluation. This finding raises serious questions concerning the Vocational curriculum's ability to more adequately prepare students for entry level skills and the world of work upon graduation.

Although there is no significant difference in Satisfactoriness ratings between Academic and Vocational male high school graduates, there is a constellation of in-school characteristics which does predict on-the-job success for both groups of males combined. In the past,

predictive in-school characteristics have rarely been found (Thorndike, 1934). The discovery of significant in-school predictors in the present study could possibly be due to improved instrumentation and increased sophistication in measurement ability. Four of the five predictors of on-the-job success uncovered in this study were similar predictors of in-school success in other studies (Kapes, 1971; O'Reilly, 1972, McAlister, 1973). This finding would suggest that there is a core of in-school characteristics which is predictive of success in general, both in-school and on-the-job. Abilities as measured by the GATB variables, V and N, are related to on-the-job success as rated by the employer. Two occupational values (Interest and Satisfaction, and Salary) as measured by the Occupational Values Inventory (OVI) are also related to on-the-job success. Vocational Maturity as measured by Crites' Vocational Development Inventory (VDI) is negatively related to on-the-job success (Satisfactoriness). This finding is in opposition to the previous VDS research in which Vocational Maturity was found to be positively related to in-school success (Kapes, 1971; O'Reilly, 1972; and McAlister, 1973).

The existence of a constellation of in-school characteristics predictive of on-the-job success might be very important in career placement and selection of appropriate exit times for high school completion. The existence of similar predictors for both in-school and on-the-job success means that there do exist some factors which predict success in general.

However, Vocational Maturity seems to be a negative predictor of on-the-job success. This relationship might well be due to the inclusion of Academic males in the sample. Vocational Maturity in

ninth grade would be associated with selection of the Academic curriculum by those students who would continue on to college. Those students with low Vocational Maturity selecting the Academic curriculum in ninth grade could, quite possibly, have selected an inappropriate curriculum which was not congruent with their true future involvements. Those graduates who do go to work when they graduate from high school could be "late bloomers" in the sense that their Vocational Maturity develops only after the ninth grade testing period. Thus, students involved in the work world one year after graduation are not necessarily less mature than those who continue with their schooling. Employed graduates might have achieved a high level of Vocational Maturity between the ninth grade testing point and one year after graduation.

No matter what the reasons for the significance of the individual variables, the most outstanding finding of this study is that selected in-school variables can predict on-the-job success. Variables measured in the ninth grade were capable of accounting for approximately 38 percent of the variance in employer's rating of on-the-job success one year after graduation. This finding means that in-school variables are capable of predicting success in the work world four years later. Further, variables from both the cognitive and the affective domains were significant contributors to this prediction capacity. Although the direction and size of each individual variable's contribution may be unclear, the magnitude of their collective ability to predict success on-the-job is more than sufficient evidence of the need for further study in this area.

Recommendations

In view of the findings and conclusions of this study, the following recommendations are suggested for further research:

1. It is recommended that this study be replicated with other samples from different communities. The relationships between in-school characteristics of students and on-the-job success in other school systems should be evaluated in order to provide additional and more generalizable information to counselors and school policy makers.
2. It is recommended that this study be replicated with a female sample to see if the same or similar relationships exist between in-school characteristics of female students and on-the-job success.
3. It is also recommended that a study be designed comparing other in-school characteristics including personality factors to on-the-job success. The discovery of a large constellation of predictive in-school factors would be invaluable to counselors, school administrators, and placement personnel.
4. A similar study comparing the same or similar predictor variables to on-the-job Satisfaction to see if there is a constellation of in-school factors which would predict on-the-job success from the point of view of the employee (i.e., Satisfaction) should be conducted.

The following recommendations are suggested for education based on the findings and conclusions of this study:

1. It is recommended that the Academic and Vocational curricula not be considered mutually exclusive or completely separate and distinct in goals. Proponents of both curricula should recognize their mutual responsibility for training students for the world of work. A career education approach to education is recommended to break down the barriers between existing curricula.
2. It is recommended that educators consider the major implications of the ability to predict on-the-job success from ninth grade characteristics and institute a program of testing and record-keeping which could help to identify the individual predictive factors necessary for both effective therapeutic and placement counseling and guidance.
3. It is also recommended that curriculum construction not be based on dichotomous thinking separating students into either one curriculum or another and that the ability to predict success in the world of work be used in designing programs to meet the needs of individuals.

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